

WHAT IS CLAIMED IS:

1. A semiconductor device capable of storing data,  
comprising:

an SOI substrate including a semiconductor substrate,  
a buried insulation layer formed on said semiconductor  
5 substrate, a semiconductor active layer formed on said  
buried insulation layer;

a plurality of elements formed on said SOI substrate;  
and

an element isolation region provided between any of  
10 said plurality of elements and formed by removing at least  
said semiconductor active layer.

2. The semiconductor device according to claim 1,  
wherein said element isolation region is formed by  
removing said buried insulation layer as well as said  
semiconductor active layer.

3. The semiconductor device according to claim 2,  
wherein said SOI substrate further includes a first trench  
formed therein, and

said plurality of elements each include a trench  
5 memory cell having a capacitor formed in said first  
trench.

4. The semiconductor device according to claim 3, wherein said SOI substrate further includes a second trench formed on a dicing line along which a cut will be made.

5. A semiconductor device capable of storing data, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, a semiconductor active layer formed on said buried insulation layer, and a first trench formed to penetrate through said semiconductor active layer and reach at least said buried isolation layer; and

a trench memory cell having a capacitor formed in said first trench.

6. The semiconductor device according to claim 5, further comprising a field shield isolation region including a field shield insulation film formed on said semiconductor active layer and a field shield conductive layer formed on said field shield insulation film and receiving a constant voltage, wherein

a cell plate electrode of said capacitor is formed by said field shield conductive film.

7. The semiconductor device according to claim 5,  
wherein said first trench is formed to penetrate through  
said buried insulation layer in addition to said  
semiconductor active layer and reach said semiconductor  
5 substrate;

said capacitor includes  
a cell plate electrode formed by said semiconductor  
substrate,  
a dielectric film formed on said first trench, and  
10 a storage node electrode formed on said dielectric  
film; and  
said semiconductor substrate receives a constant  
voltage.

8. The semiconductor device according to claim 7,  
wherein  
said capacitor further includes a polysilicon layer  
formed between said semiconductor substrate and said  
5 dielectric film, and

said storage node electrode includes polysilicon.

9. The semiconductor device according to claim 5,  
wherein said first trench has a bottom in said buried  
insulation layer.

10. The semiconductor device according to claim 5, wherein said SOI substrate further includes a second trench formed on a dicing line along which a cut will be made.

11. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer;

a plurality of elements formed on said SOI substrate; an element isolation region formed between any of said plurality of elements; and a fuse link formed on said element isolation region.

12. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation film formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer;

a plurality of elements formed on said SOI substrate; a first field shield isolation region including a first field shield insulation film formed on said semiconductor active layer between any of said plurality of elements, and a first field shield conductive film

formed on said first field shield insulation film and receiving a constant voltage;

15 a second field shield insulation region including a second field shield insulation film formed on said semiconductor active layer between said any of the elements to be separated from said first field shield insulation film, and a second field shield conductive film formed on said second field shield insulation film and receiving a constant voltage;

20 an interlayer insulation film formed between said first and second field shield isolation regions; and

a fuse link formed on said interlayer insulation film.

13. A semiconductor device, comprising:

5 an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer;

a plurality of elements formed on said SOI substrate;

a first element isolation region formed on said buried insulation layer between any of said plurality of elements;

10 a second element isolation region formed on said buried insulation layer between said any of the elements

to be separated from said first element isolation region;

an interlayer insulation film formed between said first and second element isolation regions; and

15 a fuse link formed on said interlayer insulation film.

14. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer; and

5 a fuse link formed by said semiconductor active layer.

15. A semiconductor device, comprising:

a semiconductor substrate;

a plurality of elements formed on said semiconductor substrate;

5 an LOCOS isolation region formed between any of said plurality of elements;

a fuse link formed on said LOCOS isolation region; and

a field shield isolation region including a field shield isolation film formed on said semiconductor substrate between any of the elements other than said any

of the elements, and a field shield conductive film formed on said field shield isolation film and receiving a constant voltage.

16. The semiconductor device according to claim 15, wherein

said semiconductor substrate includes,  
a buried insulation layer buried therein, and  
5 a semiconductor active layer formed on said buried insulation layer to expose a main surface thereof;  
said LOCOS isolation region is formed on said buried insulation layer; and  
said field shield insulation film is formed on said  
10 semiconductor active layer.

17. The semiconductor device according to claim 16, wherein said fuse link is formed in the same layer as said field shield conductive film.

18. A semiconductor device, comprising:  
an SOI substrate including a semiconductor substrate,  
a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said  
5 buried insulation layer;  
a plurality of elements formed on said SOI substrate;

an element isolation region formed on said buried insulation layer between any of said plurality of elements;

10 a field shield isolation region including a field shield insulation film formed on said semiconductor active layer between any of the elements other than said any of the elements, and a field shield conductive film formed on said field shield insulation film; and

15 a fuse link formed on said SOI substrate in the same layer as said field shield conductive film.

19. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer;

5 a plurality of elements formed on said SOI substrate ;  
a first field shield isolation region including a first field shield insulation film formed on said semiconductor active layer between any of said plurality of elements, and a first field shield conductive film formed on said first field shield insulation film;

10 an interlayer insulation film formed on said first field shield conductive film; and

a bonding pad formed on said interlayer insulation



15 film.

20. The semiconductor device according to claim 19,  
further comprising:

a second field shield isolation region including a  
second field shield insulation film formed on said  
5 semiconductor active layer between said any of the  
elements, on one side of said first field shield isolation  
region to be separated therefrom, and a second field  
shield conductive film formed on said second field shield  
insulation film and receiving a constant voltage; and

10 a third field shield isolation region including a  
third field shield insulation film formed on said  
semiconductor active layer between said any of the  
elements on the other side of said first field shield  
isolation region to be separated therefrom, and a third  
15 field shield conductive film formed on said third field  
shield insulation film and receiving a constant voltage.

21. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate,  
a buried insulation layer formed on said semiconductor  
substrate, and a semiconductor active layer formed on said  
5 buried insulation layer;

a plurality of elements formed on said SOI substrate;

a first field shield isolation region including a first field shield insulation film formed on said semiconductor active layer between any of said plurality  
10 of elements, and a first field shield conductive film formed on said first field shield insulation film and receiving a constant voltage;

a second field shield isolation region including a second field shield insulation film formed on said  
15 semiconductor active layer between said any of the elements to be separated from said first field shield insulation film, and a second field shield conductive film formed on said second field shield insulation film and receiving a constant voltage;

20 an interlayer insulation film formed between said first and second field shield isolation regions; and

a bonding pad formed on said interlayer insulation film.

22. A semiconductor device, comprising:

an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said  
5 buried insulation layer;

a plurality of elements formed on said SOI substrate;  
a first element isolation region formed on said

buried insulation layer between any of said plurality of elements;

10        a second element isolation region formed on said buried insulation layer between any of the elements other than said any of the elements to be separated from said first element isolation region;

15        an interlayer insulation film formed between said first and second element isolation regions; and

      a bonding pad formed on said interlayer insulation film.

23. A semiconductor device, comprising:

      an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor substrate, and a semiconductor active layer formed on said buried insulation layer;

5        a field shield isolation region including a field shield insulation film formed on said semiconductor active layer, and a field shield conductive film formed on said field shield insulation film at a prescribed region other than a dicing line along which a cut will be made.

24. A semiconductor device, comprising:

      an SOI substrate including a semiconductor substrate, a buried insulation layer formed on said semiconductor

substrat , and a semiconductor active layer formed on said  
5 buried insulation layer; and

an LOCOS isolation region formed on said buried  
insulation layer at a prescribed region other than a  
dicing line along which a cut will be made.

25. A semiconductor device, comprising:

a semiconductor substrate;

an LOCOS isolation region formed on said  
semiconductor substrate at a prescribed region other than  
5 a dicing line along which a cut will be made;

a field shield isolation region including a field  
shield insulation film formed on said semiconductor  
substrate on a side of said LOCOS isolation region  
opposite to said dicing line to be adjacent to said LOCOS  
10 isolation region, and a field shield conductive film  
formed on said field shield insulation film and said LOCOS  
isolation region and having an edge positioned more  
distant from said dicing line than an edge of said LOCOS  
isolation region.

26. The semiconductor device according to claim 25,  
wherein

said semiconductor substrate includes

a buried insulation layer buried therein, and

5        a semiconductor active layer formed on said buried  
insulation layer to expose a main surface thereof;  
      said LOCOS isolation region is formed on said buried  
insulation layer; and  
      said field shield insulation film is formed on said  
10 semiconductor active layer.

27. A semiconductor device, comprising an SOI  
substrate which includes a semiconductor substrate, a  
buried insulation layer formed on said semiconductor  
substrate, a semiconductor active layer formed on said  
5 buried insulation layer, and a trench formed on a dicing  
line along which a cut will be made, penetrating through  
said semiconductor active layer and reaching at least said  
buried insulation layer.